



Fungus-eating Ladybird  
(*Illeis galbula*)  
on Yellow Buttons  
(*Chrysoccephalum apiculatum*)

# METAMORPHOSIS AUSTRALIA

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## PLANNING AND ORGANIZING COMMITTEE 2011

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## PLANNING AND ORGANIZATION MEETINGS

A quarterly meeting is scheduled in order to plan club activities and the magazine.  
See BOIC Programme.

## CONTACT ADDRESS AND MEMBERSHIP DETAILS

PO Box 2113, Runcorn, Queensland 4113

Membership fees are \$25 for individuals, schools and organizations.

## AIMS OF ORGANIZATION

- To establish a network of people growing butterfly host plants;
- To hold information meetings about invertebrates;
- To organize excursions around the theme of invertebrates e.g. butterflies, native bees, ants, dragonflies, beetles, freshwater habitats, and others;
- To promote the conservation of the invertebrate habitat;
- To promote the keeping of invertebrates as alternative pets;
- To promote research into invertebrates;
- To encourage the construction of invertebrate friendly habitats in urban areas.

## MAGAZINE DEADLINES

If you want to submit an item for publication the following deadlines apply:

March issue – February 1st

June issue – May 1st

September issue – August 1st

December issue – November 1st

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## COVER

Fungus-eating Ladybird (*Illeis galbula*) on Yellow Buttons (*Chrysocephalum apiculatum*) – Painting by Lois Hughes



## FROM THE PRESIDENT

We are again indebted to those whose contributions ensure that this edition of our magazine is interesting, informative and at times entertaining. Lois has written a little to give you a glimpse of some of our “behind the scenes” activities. After her work on a rather tiny ladybird, I suggest we could look at a species of mite for a cover story!

Butterflies, beetles, grasshoppers, katydids, moths, spiders and stick insects have all rated a mention. The links to various web pages lead to a kaleidoscope of colour. My personal favourite is <http://www.abc.net.au/catalyst/stories/3160792.htm>

There are frequent reminders of significant gaps in our knowledge of invertebrates so it is of great concern when we hear of continued cuts to research funding in this and other areas of science. This blinkered approach by governments in the interest of “saving” money can only leave us poorer in the longer term. In this context, the work of volunteers/amateurs increases in value.

At our recent planning meeting, club member Jeannine Kimber and her son Nathan offered to host a junior member’s group of the BOIC. Younger members, families with children and the young at heart all with an interest in butterflies or other invertebrates are invited to contact Jeannine by phone (07 3878 3359) or by email ([j9k@iprimus.com.au](mailto:j9k@iprimus.com.au)) to express interest and offer suggestions. Best wishes **Ross**

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## A Glimpse of Nature – Ron May

When is a bird not a bird? When it's a ladybird. "Good day, my name is Illeis, that is *Illeis galbula*, the fungus-eating ladybird (family Coccinellidae)."

It was in the year 1850 in Paris when Mulsant first described my ancestors. My species has a liking for powdery mildew (family Erysiphaceae). This fungus affects a wide range of plants, from ornamentals to trees, crop plants and vegetables, which keep us coccinellids well fed.



*Illeis galbula* – Photo Ron May

If you cultivate any plants which are susceptible to the pathogen Powdery Mildew, then you need me and my mates as biological control agents to combat this disease, rather than using chemicals.

### References:

Agricola, George N. 1988. *Plant Pathology*. Academic Press Inc.  
 Naumann, Ian 1993. *CSIRO Handbook of Australian Insect Names*.  
 CSIRO Publishing, Melbourne.

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## A Fungus Eating Ladybird Beetle (*Illeis galbula*) Mulsant - Dr.

Adam Slipinski, Research Entomologist, Australian National Insect Collection, CSIRO Ecosystem Sciences, GPO Box 1700, Canberra ACT 2601

*Illeis galbula* Mulsant is a member of a small genus of ladybird beetles with about 15 species distributed from Japan and China to New Guinea and Australia. They have traditionally been classified in the tribe Psylloborini, later renamed as Halyziini.



Halyziini share relatively large, glabrous (not covered by hairs), colourful bodies with well-known ladybirds from our gardens but they are neither carnivorous nor herbivorous, instead they feed on powdery mildew of the genus *Oidium*, a type of fungi growing on various plants. To be able to feed on such a diet, the beetles and larvae have comb-like structures on their mandibles used to scrape and process the fungal particles.

*Illeis galbula* Mulsant – Photo Hongming Kan



Adults are from 3.6 to 5.5 mm in length while the larvae are between 8 and 10mm long. Adults are bright yellow with black markings while larvae and pupae are white with black dots. During the day the ladybird is fast moving and readily flies or drops when disturbed.

There were successful attempts in California to use a related genus, *Psyllobora* Mulsant, as a biological control agent of mildew fungi in vineyards and plantations of ornamental plants. *I. galbula* is known from New Guinea and reaches south to New South Wales and northern Victoria. A second species, *I. flava* Pope with uniformly yellow elytra is known only from a few localities in southern Queensland and northern New South Wales.

There is still much to be learned about these colourful insects.

#### References:

Slipinski, Adam, 2007. *Australian Ladybird Beetle (Coleoptera: Coccinellidae) Their biology and classification*. CSIRO Publishing .

Ed. – The above-mentioned book is now out of print but there is an excellent web site developed by the author at <http://www.ento.csiro.au/biology/ladybirds/ladybirds.htm#>

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### Ladybird Photo Gallery – Images by Russel Denton

#### References:

[http://www.brisbaneinsects.com/brisbane\\_ladybirds/LadybirdFieldGuide.html](http://www.brisbaneinsects.com/brisbane_ladybirds/LadybirdFieldGuide.html)

Slipinski, Adam, 2007. *Australian Ladybird Beetle (Coleoptera: Coccinellidae) Their biology and classification*. CSIRO Publishing, Melbourne.





Fig. 1 Orange-spotted Ladybird - *Orcus australasiae* (Boisduval)

Fig. 2 Transverse Ladybird - *Coccinella transversalis* (Fabricius)

Fig. 3 Yellow Shouldered Ladybird – *Apolinus* (*Scymnoides*) *lividigaster* Mulsant

Fig. 4 Striped Ladybird - *Micraspis frenata* (Erichson)

Fig. 5 Steelblue Ladybird- *Halmus chalybeus* (Boisduval)

Fig. 6 Twenty-Six Spotted Potato Ladybird –*Epilachna (Henosepilachna) vigintisexpunctata* (Boisduval)

Fig. 7 Variable Ladybird - *Coelophora inaequalis* (Fabricius)

Fig. 8 Netty or Tortoise-shelled Ladybird- *Harmonia testudinaria* (Mulsant)

Fig. 9 Common Spotted Ladybird - *Harmonia conformis* (Boisduval)

## A COVER STORY

### A peep behind the scenes of a cover painting – Lois Hughes

When asked to do a cover painting, it is rarely simple or straight forward. It often helps if I can read the article. The brevity of this article revealed it was a fungus eating lady beetle that was especially useful if growing mildew prone vegetables such as pumpkins or cucumbers. Not too much inspiration there!



My thoughts and self-talk/conversations went something like this. I picture it on a pumpkin flower – got some in the garden. “It would be nice if it was on a native plant” was one comment I received. Rethink. How about a paper daisy? They get mildew on their leaves. Check garden – paper daisies all dead – too much rain. Begin search of gardening magazines – no images with leaves – found clear images of lady beetles though.

Ross rings, did I receive lady beetle images from him and Daphne. Yes, but too fuzzy around legs and antennae, but I do now know the species. He sends paper daisy images.

Ready to start drawing. What size? Lady beetle is between 4-6 mm. Enlarge it 10 times so it's a reasonable size to paint details. That should work. Enlarge paper daisy flower 10 times – 500 mm – that definitely won't work. Bother! Days turn into weeks, still no inspiration.



*Chrysoccephalum apiculatum*

Photo provided by  
Redlands IndigiScapes Centre

mildew? Don't know. Do lady beetles frequent them? Don't know. Not sure if it's botanically correct.

Hope you like it anyway.

Ed.: Yes, we do like it. All this going on in Lois's head! We put Lois through a lot don't we? She does produce spectacular paintings though. The image on the right is more like the actual size of the beetle and flowers.



## PRESIDENT'S REPORT FOR 2011 AGM

The March edition of *Metamorphosis Australia* was the 60<sup>th</sup> edition of the “Newsletter” that became our “Magazine” in September 2008. The Magazine continues to be our main contact with club members and articles contributed by many



members ensure that it is both interesting and informative. I again thank all those contributors for their “work” and invite club members to submit ideas, which they believe could further improve the magazine and, of course, to send more articles for publication.

Sixty editions mean that Daphne has been our editor for fifteen years! Each quarter Daphne takes the various articles received, liaises with the writers and her “expert” reviewers, combines the articles for the next edition, submits the final result to our printers and reviews a proof copy with Peter Hendry before giving the final go-ahead for printing. Simultaneously, she prepares address labels and envelopes (and the dreaded “covers” for those who are a little tardy with subscription renewal) so that the Magazine will be mailed out on time. Thank you Daphne.

I also thank Daphne for her wonderful ambassadorship for the Club as she responds to an increasing range and number of enquiries over the year. This contact with the wider community signifies that our club is able to make an impact in those areas that we believe are important.

It was quite a significant achievement when the expanded third edition of the popular “Butterfly Host Plants of South-east Queensland and Northern New South Wales” was published in November 2010. This was largely as a result of huge efforts by John Moss who had compiled a large body of new information.

The Club also published the booklet “Butterfly Gardens 4 Schools” generously written by Dave St Henry to share the knowledge distilled by him over many years of working with schools in the Rockhampton area.

Lois’s paintings continue to light up the cover of our Magazine, Rob continues to keep our accounts in order and the imminent completion of a PhD by Alisha will allow her to concentrate on Club “expeditions” again.

Last year Ray Archer formed the concept of Butterfly Plants for Poverty. Ray, Delphine and a team of volunteers deserve congratulations for the rapid development of the project. I am sure that you could not have failed to hear of it. The ready supply of butterfly host plants fits closely with the primary aims of our Club.

The Club had direct community contact through a number of displays during the year. These displays allow us to make a significant contribution to increased community awareness and involvement in environmental rehabilitation. Unfortunately, we have had to decline some invitations to display due to a shortage of club “volunteers.”

Thanks to the help of Rod Jackson, some improvements have been made to the Club website. It is planned that we will have a major revision of this website in the coming months.



From my perspective we have had a successful, busy year. I have now completed five years as Club President and I sometimes think that it is time to hand over to a younger person with fresh ideas. Any suggestions?

Ross Kendall

### ITEMS OF INTEREST

#### The “Ayes” have it – Hilton Selve



My first sight of the Spiny Leaf Insect (*Extatosoma tiaratum tiaratum*), also called Macleay's Spectre, came in December 2010 when I found a female clinging to the brick wall of our verandah. My immediate impression was that it is well named; it really is spiny. (Fig. 1) Lois Hughes had written about this insect and her article was published in “Metamorphosis Australia” Issue No. 53 in June 2009.

To me the most striking features of this astonishing insect were its eyes. They had to be compound, as are all insects' eyes. But these eyes had a pupil and what's more the pupil followed all my movements and the movements of my camera! This could not be true, but what was going on? (Fig. 2 and 3)



I am indebted to Prof. Eric Warrant and Prof. Michael Land, FRS for an explanation of how I was fooled. They explained that the pupil I was seeing was known as a pseudopupil and it of course doesn't move. What I was seeing were facets of the compound eye, the ommatidia. Of the thousands of ommatidia, those that were in a direct line of my eyes appeared black, as ommatidia are such efficient absorbers of light that no light was reflected back to me, so the area appeared black.



A moderately enlarged microscopic picture of the eye shows these ommatidia. In the centre is the pseudopupil but on the periphery there are many others. (Fig. 4) Revisiting my pictures revealed that the pseudopupil is not circular as my brain told me they were, but square or rectangular. Other ommatidia are visible in my pictures, those of course, which are not pointing directly at the camera.

A number of other insects have pseudopupils e.g. butterflies, bees, dragonflies, grasshoppers and preying mantids.

I photographed the eye of a grasshopper. (Fig. 5) The pseudopupil is clearly seen.

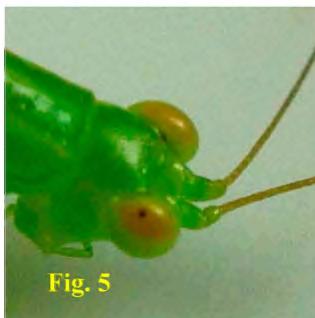


Fig. 5

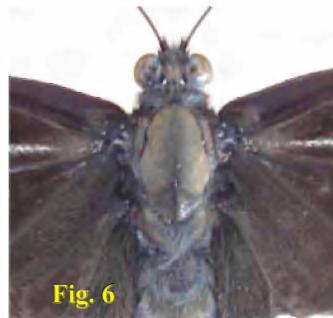


Fig. 6



Fig. 7

The photographs of two newly emerged butterflies show pseudopupils. The White Banded Plane (*Phaedyma shepherdii*) shows its pseudopupil well, but who ever heard of a butterfly with a squint?! (Fig. 6) The eye of a Jezebel Nymph (*Mynes geoffroyi*) is even more astonishing; it doesn't have a single pseudopupil but a veritable checkerboard. (Fig. 7)

Thanks are due to Enid Selvey for her skill in downloading and printing my pictures.

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### Life history notes on the moths *Gonodontis luteola* (Turner, 1904) (Lepidoptera : Geometridae) and *Speiredonia spectans* (Guenée, 1852) (Lepidoptera : Noctuidae) – Peter Hendry and John Moss

#### Preamble

In November 2005 John Moss and Ross Kendall returned from a field trip to the Hendry's bush block, some 28 km SW of Gin Gin. They were excited by a large collection of various lepidoptera larvae collected in dry vine scrub. Peter was called upon to photograph the collection and over the following weeks recorded the subsequent pupal and adult stages. This is where the story began and nearly ended! At the time, with his computer down, Peter transferred the images to disk via a work computer and in spite of several searches over the ensuing years the images were not



to be found. In a subsequent mishap John lost the adults when a storage freezer broke down.

After completion, in late 2010, of a lepidoptera studio to house his collection, Peter moved all the computer disks from the house to the studio. In February 2011 Jak Guyomar gave him a disk of unrelated larvae for identification. After an initial look the unmarked disk was placed with all the others. Subsequently, finding the time to have another look at Jak's images, the first disk placed in the computer contained the missing images from 2005!

*Gonodontis luteola* Geometridae : Ennominae



Fig. 1



Fig. 2



Fig. 3



Fig. 4



Fig. 5

*Gonodontis luteola*  
Larvae Figs. 1 to 3  
Adult Fig. 4 & 5



This species, found feeding on *Flindersia australis*, fam. Rutaceae, had the most unusual larvae collected on the trip. The larvae have a pair of long dorsal protuberances on the second abdominal segment. While other geometrids e.g. *Oenochroma* species and indeed larvae from other families have short dorsal protuberances, the length of these makes them quite bizarre. A larva collected on the 15/11/2005 had pupated and emerged by the 9/12/2005. At that time both of us were clueless as to what the species was. When Peter recovered the images he immediately recognized it as a *Gonodontis* species. After co-authoring, with the late Murdoch De Baar, an article on *Gonodontis orthotoma* (*Metamorphosis Australia* issue 59), in which they stated they could find nothing on its biology, Peter is now happy to find something on one of the five known Australian species. It is noted that of the plant families recorded as hosts for overseas species, Rutaceae is not amongst them! On the 10/04/2010 a specimen of *G. luteola* was taken at a light trap at the same site.

*Speiredonia spectans* Noctuidae : Catocalinae



Fig. 6



Fig. 7



Fig. 8



Fig. 9

*Speiredonia spectans*  
Larvae Figs. 6 & 7  
Pupa Fig. 8  
Adult Fig. 9

It has long been reported (Common 1990, Monteith 2007) that nothing is known of the biology of the Granny's Cloak Moth, *Speiredonia spectans*. This common species is often found clustering under houses, in garages and other dark places. On Peter's bush block it has appeared in large numbers in the outdoor loo! Once, when jumping on top of a hollow log, hundreds flew from within! John found the larvae feeding on



Yellow Tulip, *Drypetes deplanchei* fam. Euphorbiaceae. While this plant is widespread, mainly in dry vine scrub, we do not believe it can be the only host plant involved, due to the appearance of the moth in other situations. *S. spectans* occurs in the Northern Territory and from the Atherton Tableland, Queensland, to central New South Wales (Common 1990). Common noted a V.J. Robinson record of the related species *S. mutabilis* feeding on acacia. John subsequently found the larvae at Mt. Elliott, Townsville, in 2006, again feeding on *D. deplanchei*. The larvae collected on the 15/11/2005 had pupated by the 25/11/2005 and emerged by the 9/12/2005.

Photos Peter Hendry

References:

Common, I.F.B. 1990. *Moths of Australia*. Melbourne University Press.

Monteith, G.B. 2007. Butterflies and Moths. In *Wildlife of Greater Brisbane*. 2<sup>nd</sup> Edition. Queensland Museum.

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## Life history notes on the Green Awl, *Hasora discolor* (C. Felder & R. Felder, 1859) Lepidoptera: Hesperiidae - Wesley Jenkinson



This beautiful small butterfly occurs sporadically along coastal regions of Queensland and into northern New South Wales. Its favourite habitat is lowland tropical, subtropical and littoral rainforest where the host plant vine Burny Bean (*Mucuna gigantea*) is established. The adults also breed in suburban gardens in some Brisbane suburbs. The species is generally uncommon and localised, however during favourable seasons

the adults can be more numerous.

Several years ago I planted three *M. gigantea* vines in my garden hoping to raise *H. discolor* larvae at a future date. The vines have since been well utilised by the unusual or perhaps bizarre looking larvae of another butterfly species, the Common Aeroplane or White-banded Plane (*Phaedyma shepherdii*).

On the 17<sup>th</sup> January 2011, during Queensland's record rainfalls, I noticed a fresh male flying in my garden at Beaudesert in Southeast Queensland. Having always lived in this region, this was my first sighting (totally unexpected) in the district. I had pruned the aggressively growing vines and mowed the trimmings into garden mulch two weeks previously. Perhaps this had attracted the adult to the garden. The species is known to have migratory tendencies (Andrew Atkins pers. comm.). Several days



later, on the 23<sup>rd</sup> January 2011, John Moss located several small larvae in shelters on the vines, indicating that a female had also visited the garden.

The sexes are difficult to separate with the males lacking any sex brand. However the female's abdomen is usually slightly wider than the males.

Wingspans for the pictured adult specimens are males 38mm and females 40mm.



*Hasora discolor*

Images left to right: male, female, male underside, female underside

Typical of the genus, the adults are very rapid fliers but can be observed resting below leaves during very hot sunny conditions and while roosting during the day. They also fly shortly after sunrise on hot days with the males patrolling forest canopy in search of females. The adults of both sexes feed from small native and exotic flowers. The females are encountered fluttering around the host vines searching for suitable sites to lay the eggs.

When ovipositing, the female's wings remain closed and the eggs are laid singly, usually on the underside of fresh leaves of the host plant.



The eggs are white, dome shaped and are approximately 1.0 mm wide with 18 vertical ribs.

←Freshly laid egg

Last year, eggs collected in January 2010 were raised to adults in captivity. Two tiny larvae hatched by 7.00 a.m. and the eggshells were not consumed. Shortly after emergence the larvae commenced creating small shelters, cutting a semicircular piece

and folding it below the leaf and stitching with silk (similarly described by Common and Waterhouse, 1981). The small larvae fed by chewing small holes in the shelter. Larger larvae fed on other leaves near the shelter. Several silk lined shelters were created throughout the larval duration and the larvae were observed feeding at dusk. When sleeved on the host plant, the pupae were located in the final uneaten shelters.



Shelter with 2<sup>nd</sup> instar larva

One larva observed completed five instars and attained an approximate length of 38mm.



1<sup>st</sup> instar larva



2<sup>nd</sup> instar larva



3<sup>rd</sup> instar larva



4<sup>th</sup> instar larva



5<sup>th</sup> instar larva



Pupa

The pupa, measuring 27mm in length, was located hanging by the cremaster and a silken 'Y' shaped girdle in the final shelter (facing ventral side up). It was very finely covered in a white waxy powder.

An egg collected 15<sup>th</sup> February 2010 hatched in 6 days. The larval duration

was 18 days and pupal duration 13 days. The adult emerged in March, 37 days afterwards.

Within the new boundary of the Scenic Rim Regional Shire south of Brisbane, the only records I have are from one male recorded at my residence on 17<sup>th</sup> January 2011, one female unsighted (but larvae present) and subsequent adults emerging from these larvae seen on 23<sup>rd</sup> January 2011.

Plantings of *M. gigantea* on properties and suburban blocks in coastal and sub-coastal areas may attract opportunistic adults into new areas.

Photos Wesley Jenkinson

#### References:

Braby, M.F., 2000. Butterflies of Australia – Their Identification, Biology and Distribution. Vol. 1. CSIRO Publishing, Melbourne.

Common, I.F.B. & Waterhouse, D.F., 1981. Butterflies of Australia (revised edition). Angus & Robertson Publishers, Sydney.



## Celebrity spiders - Robert Whyte

The celebrities of the spider world are certainly jumping spiders (family Salticidae), especially in America and Great Britain where the work of macro photographers Tomas Rak, in the UK, and Thomas Shahan, from the USA, have broken into newspapers and onto daytime television. Thomas Shahan, studying art at college, was featured on the *Today Show* with his photos of North American jumping spiders from his home state of Oklahoma.



Adult female *Phidippus mystaceus* jumping spider by Thomas Shahan, Creative Commons BY 2.0  
<http://creativecommons.org/licenses/by/2.0/deed.en>

Thomas Shahan has a photostream on Flickr, and shares his photos under a Creative

Commons license. He even has a YouTube video of the antics of an adult male *Phidippus mystaceus* with his own singing and guitar playing as a sound track.  
[http://www.youtube.com/watch?v=hoBm\\_Hgc6Y](http://www.youtube.com/watch?v=hoBm_Hgc6Y)



Thomas Shahan's set of jumping spiders on Flickr



Closer to home, arachnologist Dr Jurgen Otto was featured on *Catalyst* with his extraordinary films of a *Maratus* sp. in full courtship display. The story with spider video can be seen here: <http://www.abc.net.au/catalyst/stories/3160792.htm> — a triumph of careful observation and perseverance. To get her attention the male waves his legs at the female and finally, like a peacock, he raises two brilliantly coloured flaps and dances with his ‘wings’ extended.



*Maratus volans* male displaying to a female. Photo Jurgen Otto. You can see more of Jurgen's photos and movies at:  
<http://www.youtube.com/watch?v=9GgAbyYDFeg>  
<http://flickr.com/photos/59431731@N05/sets/72157625910288895>  
and  
<http://www.youtube.com/watch?v=ppP03ERHbUI>

With over 5000 species, Salticidae is the largest of the spider families. When all species are described, if they ever are, the number of salticid species might be as many as 40,000. They are widely distributed over the planet and even Mount Everest has its own species, *Euophrys omnisuperstes*. Jumping spiders can spring more than 50 times their own body length to land on their prey. They have excellent vision, with four big eyes in front and four smaller eyes on the top of their head. Their biggest, central, eyes have moveable retinæ and telescopic lenses enabling accurate depth perception and magnification up to four times life size. These eyes do, however, have a narrowly focussed field of view, necessitating the characteristic head-swivelling behaviour so often noticed in the field as they watch you, the observer.

Do you have any fascinating encounters with jumping spiders to share?

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## Insect Gall formation on Bulloak (*Allocasuarina luehmannii*) – Peter Hendry

I received the images of a gall on Bulloak (*Allocasuarina luehmannii*) from Martin Bennett. He had sent them to the Queensland Museum and received the following reply from Christine Lambkin (Biodiversity Curator, Entomology) and Penelope Mills (PhD candidate, School of Biological Sciences, University of Queensland).



“The gall is formed by a true bug belonging to the Family Eriococcidae, Superfamily Coccoidea, Suborder Homoptera in the Order Hemiptera. The species responsible I believe is *Cylindrococcus casuarinae*.”



*Allocasuarina luehmannii*  
seed capsules - Photo Peter Hendry

Gall on *Allocasuarina luehmannii* and *Cylindrococcus casuarinae* inside – Photos Martin Bennett



*Hypochrysops piceata* underside  
Photo Peter Hendry

It is fascinating to see the red bracts making it look like a fruit. John Moss thinks it is a converted early female cone. *A. luehmannii*, like all Allocasuarina and Casuarina species, has a woody seed capsule (see photo). *A. luehmannii* is known to lepidopterists as the host plant for the endangered Bulloak Jewel butterfly (*Hypochrysops piceata*). In spite of the fact that Bulloak occurs in many parts of Queensland from the far north to the border and as far west as Longreach and is

also found in New South Wales and Victoria, the butterfly is only found in a small pocket on the Darling Downs, Queensland.

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## Lepidoptera legacy of the summer that was 2010/11 – Peter Hendry

The summer of 2010/11 will long be remembered as the summer of natural disasters and in the case of cyclone Yasi a disaster on the natural history front as well. However, in many areas the natural history has benefited from the flooding rains, which produced extended growth periods for much of the plant population and the increase in insect numbers was noticeable. I was one on the lucky ones, sitting high and dry with a few manageable leaks in my roof. I have enjoyed seeing more butterflies in my garden than I can remember!



Species like the Chequered Swallowtail (*Papilio demoleus*), which is a rare visitor to my garden, were here for an extended period with a record number of seven individuals in one day! Bordered Rustics (*Cupha prosope*), never seen here previously, arrived in December and are still on the wing. They have now bred in the garden. Another first time breeder was the Yellow Admiral (*Vanessa itea*), again rarely seen here. I watched as a female appeared to lay eggs on a stinging nettle (*Urtica incisa*) that I had purchased at the launch of Ray Archer's Butterfly Plants for Poverty. She was not happy with my presence and left the host plant as I moved in to observe. I moved back inside the studio and

waited till she appeared to have laid more eggs. Returning to check, I found a batch of eggs. I went back inside the house and left her to it. An hour later I returned to find a few black ants

where I had noted the eggs, but no eggs remained! She returned the next day and once I knew she had laid again I immediately collected a few eggs, four in all, of which three progressed to adulthood.

If you do not have the exotic Plumbago (*Plumbago auriculata*), put it on your wish list. The Zebra Blue (*Leptotes plinius pseudocassius*), which feeds on the fruit, produced hundreds of butterflies this summer. To arrive home from work and see a "cloud" of these small butterflies always brings a smile to my face.

Even the Common Crow (*Euploea core corinna*) was in larger numbers than usual. I found it breeding on *Carissa ovata* for the first time. This prompted me to check the *Hoya australis* another recorded host plant of the Common Crow, which has never been used in my garden. The result - still not used. However my sister-in-law gave me an exotic Hoya for my birthday which was hung up outside under the eaves and "Walla!" the crows took to it straight away. The Common Redeye (*Chaetocneme beata*), while seen rarely, was noticeably more common this year.



*Cupha prosope*



Eggs and larva of *Vanessa itea*



*Chaetocneme beata*



On the moth front, I found larvae of the hawk moth (*Nephele subvaria*) also on the *Carissa ovata* for the first time. *Sauris malaca*, fam. Geometridae, a small greenish moth, had taken to the fresh new growth on my Black Booyong (*Argyrodendron actinophyllum*). In his book Moths of Australia, Ian Common notes that it only feeds on “fresh new growth”, but does not list the Black Booyong as a host, so this is possibly a new record. At the light trap I have enjoyed concentrating on some small moths in the Acontiinae subfamily of the Noctuidae.



Larva and adult of *Nephele subvaria*



*Sauris malaca* Larva, adult and pupa



Three examples of Acontiinae moths – wingspans about 20 mm

*Autoba abrupta*

*Autoba pectorora*

*Enispa parva*

To those affected by the disasters I hope you have all coped well. Maybe just the sight of that unusual, not often seen butterfly or other insect, will bring some joy.

Photos Peter Hendry



# Interesting Variations in Pierid Butterfly Adult Morphology (A presentation delivered to the Entomological Society of Queensland in May 2006 by John Moss and Ross Kendall and adapted for this issue of the magazine)

## BACKGROUND

**Phenotypic variation** in butterflies may be classified as individual, geographic, seasonal, other environmental and sexual (especially with respect to mimicry). We examine both individual and seasonal variation in two genera of pierid butterflies namely, *Catopsilia* and *Eurema*.

**Seasonal polyphenism** appears to come about as a result of temperature changes, day length variation (photoperiod) and possibly in response to rainfall (Rienks, 1985). For many of the pierids, high temperatures and especially long photoperiods result in “summer” or wet season forms while conversely lower temperatures/short photoperiods produce “winter” or dry season forms. The wet season forms generally have darker wing uppersides and paler undersides. On the other hand many dry season pierids exhibit dark underside patterning. “The adaptive significance of seasonal forms remains unclear.” (Braby, 2000)

Both *Catopsilia pomona* (Lemon Migrant) and *C. pyranthe* (White Migrant) produce distinctive seasonal forms. *C. gorgophane* (Yellow Migrant) and *C. scylla* (Orange Migrant) do not exhibit this phenomenon but each has a distinctive form which is not day length or temperature dependant, can occur at anytime throughout the year and presumably is genetically controlled (Dunn, 1995).

The terms “albinistic” and “melanistic” have been used to describe these environmental effects, but care needs to be taken not to confuse this with the genetically determined and/or spontaneously mutated true albinos and melanos which are uncommon. We present here a case of apparent true **albinism** in the butterfly *Catopsilia pomona* (Fabricius, 1775) and striking **melanism** in the butterfly *Eurema hecabe* (Linnaeus, 1758) as well as an interesting variation in the wing pattern of another specimen of the latter species.

## OBSERVATIONS AND DISCUSSION

### *Catopsilia*

In early April 2006, we noticed two or three very white migrant butterflies amongst the mixed population of both dark and pale (or “summer” and “winter”) forms of Lemon Migrants in Ross’s butterfly flight cage. April is usually the seasonal “shoulder” for this butterfly and both wet and dry season forms were in evidence. One was collected and found to be a male with total white coloration on both upper and underside of all four wings except for a very slight black mark on the apex of the forewing upperside. This clearly was not the “winter” (pale or dry season) form of *C.*



*pomona* and was quite different to *C. pyranthe* (the White Migrant) and the pale form (*hindia*) of *C. gorgophone* (the Yellow Migrant).

*C. pomona* is a widespread butterfly in the tropics and several geographic forms (subspecies) are known in the Australasian and Oriental regions, some of which approach this **phenotype** in coloration. However, the extreme albinism led us to believe that our specimen was in fact a true albino, in spite of the fact that our first observations were of more than one similar specimen. (The others, on searching, proved elusive!)



Normal seasonal variation in both males and females of *C. pomona*. Left column: wet season (dark) form. Right column: dry season (pale) form.



Individual variation of the undersides of females of the dry season or pale form of *C. pomona*; the bottom specimen being a conspicuously marked form, known as *catilla*.



A stunted female dark or "summer" form of *C. pomona* and a normal sized female.



Albino aberration (centre bottom), wet season males (left column), dry season males (right column) and an intermediate form (top centre) of *C. pomona*.





Upperside and underside of an extreme albinistic male *C. pomona* which appeared spontaneously in Ross's flight cage, containing a breeding population of originally wild-caught individuals (early in April 2006).



Males of normal *C. pyranthe* (upper), *C. pomona* albino aberration (centre) and normal *C. gorgophone* (lower).



Individual variation in male *C. gorgophone*



A normal female *C. gorgophone* (left) and upper and lower views of form *hindia* (right)





“Summer” or dark form *C. pyranthe* showing male (top) and female (bottom) upper and undersides.



“Autumn” or pale form *C. pyranthe* showing undersides of male (top) and female (bottom).

### *Eurema*

Later that month, in the same flight cage, an unusually dark specimen of the common *Eurema hecate* (Large Grass Yellow), was discovered by Ross and the late Murdoch De Baar who on first sighting the specimen remarked jocularly “Surely you’re not flying an exotic species?!” As can be seen from the images in this article, the yellow scales on both the upper and undersides have been completely replaced by brown! This type of extreme melanism is a very rare finding and most likely resulted from a genetic mutation.

John discovered another interesting pattern variation at West Mt Cotton in the Redland Shire on 9<sup>th</sup> October 1994. As the images show, it is missing the usual colour indentations into the black forewing margin. In appearance it is indistinguishable from the Taiwanese subspecies *E. hecate hopsoni*! It is interesting to speculate whether the spontaneous mutation that caused this **phenotype** resulted in exactly the same **genotype** as the population flying on Formosa Island!

Yata (1995) recognised 18 subspecies of *E. hecate*, but Braby (2000) states that “Many of the previously recognised subspecies apparently form a north-south cline from Japan to Australia.” Thus Braby only recognises one subspecies *E. h. hecate* in the Australian subregion.

Two “good” species of Australian *Eurema*, namely *E. sana* and *E. laeta lineata*, originally considered to be distinct species, were found to be seasonal variations [confirmed by breeding experiments by Jones et al (1985)].

It would be interesting to do U.V. light reflectance photography with these variant *Eurema* species to ascertain if the pattern in the individuals exhibiting extreme variation is different from that in the normal.





A male melanistic aberration of *E. hecate* (centre) with normal male (above) and female (below).

In April 2006, the aberrant specimen appeared in a population of the progeny of originally wild-caught specimens breeding in the flight cage.



Normal form male (top) and an extreme pattern variation male of *E. hecate* (bottom) both collected by John, near Mt. Cotton in the Redland Shire, on 9<sup>th</sup> October 1994. The absence of yellow colour indentations into the black forewing margin is unusual.



Undersides of the adjacent specimens Note the top (male) specimen is a wet season form and the bottom (female) a dry season form showing increased maculation.



A comparison of the normal form male (top left) and variant form male (bottom left) with the sympatric species *E. laeta sana*, *E. smilax*, *E. herla* and *E. brigitta* (top to bottom on right).





Normal *E. hecate* (left top), the Mt. Cotton variation (left centre) *E. hecate* subspecies *hopsoni* from Formosa Island (Taiwan) (right centre) and *E. blanda* from Torres Strait (right bottom). It will be noted that this variation and the *hopsoni* subspecies are indistinguishable.

Photos Ross Kendall

## GLOSSARY:

**Albinism** is either partial or total absence of colour pigment. In a butterfly this results in pale or even pure white scales on the wings and body, often with pink antennae, eyes and legs. [Derived from the Latin “alba” meaning white.]

**Genotype** relates to an organism’s full complement of genes on its chromosomes.

**Melanism** is an unusually large increase in dark pigment cells. In butterflies this results in dark forms, sometimes with all the coloured scales being replaced by dark brown/black scales. [Derived from the Ancient Greek “melas” meaning black.]

**Phenotype** is the physical expression of an organism’s genetic complement.

**Phenotypic variation** in general relates to changes in the morphology (appearance) of an organism compared to other individuals of the same species – in this case the adult butterfly.

**Seasonal polyphenism** is variation in the morphology of individuals as a result of the influence of seasonal environmental factors. Effectively, this means that the adult butterfly has both wet season (“summer”) and dry season (“winter”) forms. Some individuals can be intermediate or transitional.

## References:

Braby, M. F., 2000. *Butterflies of Australia, their Identification, Biology and Distribution*. CSIRO Publishing, Melbourne.

Dunn, K.L., 1995. *Notes on the biology and wing variation in Catopsilia gorgophone gorgophone (BOISDUVAL)*. Victorian Entomologist 25 (6) 106-116.

Jones, R. E., Rienks, J. and Wilson, L. (1985). Seasonally and environmentally induced polyphenism in *Eurema laeta lineata* (Lepidoptera: Pieridae). *Journal of the Australian Entomological Society* 24: 161-167.

Rienks, J. 1985. Phenotypic response to photoperiod and temperature in a tropical Pierid butterfly. *Australian Journal of Zoology* 33: 837-847.

Yata, O. 1995. A revision of the Old World species of the genus *Eurema* Hubner (Lepidoptera: Pieridae). *Bull. Kitakyushu Mus. Nat. Hist.* 14: 1-54, pls 1-35.



## ***Gonodontis luteola* – Peter Hendry**

After the completion of the article on Life history notes on *Gonodontis luteola* (see Page 10), I discovered, in my collection, a female collected at the same site on the 12-02-2011.

From what I have seen, the genus *Gonodontis* appears to be sexually dimorphic.



*Gonodontis luteola* - male



*Gonodontis luteola* - female

Photos Peter Hendry

### **NEW HOST PLANT RECORD**

#### **New host plant record for the Orchard Swallowtail (*Papilio aegeus*) – John Moss**



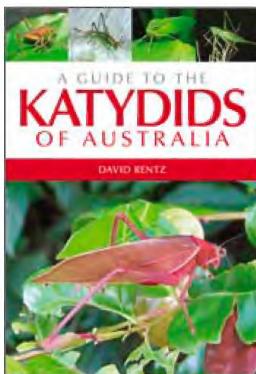
Orchard Swallowtail larva on *Citrus glauca* – Photo Glenn Leiper

Braby (2000) lists 38 hostplants for the Orchard Swallowtail butterfly throughout its full range. Moss (2010) lists 26 species (all family Rutaceae) for the Southeast Qld/Nth NSW region, including 12 species not in Braby. Two native citrus species are included in each listing but *Citrus (Eremocitrus) glauca* which occurs naturally in Softwood and Dry Vine Scrub has not previously been recorded. This new observation (by Glenn

and Judy Leiper) was on a native limebush in their Beenleigh garden in March 2011.



**“A Guide to the Katydid of Australia” by David Rentz - Review by Densey Clyne**



It was in my early days with a camera that I had my first close encounter with a katydid, and at once I fell in love. Looking directly into my camera lens, a common garden *Caedicia simplex* was washing her face with her front feet, like a small green pussycat with pink eyes. If I were not a down-to-earth naturalist I would say that she was using the lens as a convenient mirror. Ever since then katydids have been great favourites of mine, and so I am delighted to review this field guide written by Australia's leading expert on the Orthoptera.

The book's Introduction sorts out the katydid family (Tettigoniidae) from closely related families within the Orthoptera. David explains the origin of the name 'katydid' (used in Australia, New Zealand and the United States though not the United Kingdom) which has its American origins back in the 1800's. I remember the "What Katy Did" books for children, about the adventures of a little American girl of the 1860's, the title presumably a play on the 'katydid' call of a common American species.

The chapter on Biology starts with the distribution of katydids worldwide and provides a detailed and interesting introduction to katydid life styles. The section on Reproduction describes mating, with the external transfer by male to female of a rather gooey-looking (my words) spermatophore, comprising a sperm package surrounded by a nourishing meal for the female. While she concentrates on eating this, the sperms move into her spermatheca where they are stored until egg-laying takes place. With katydids, as with other insects, a complex genital 'lock and key' mechanism ensures that only males and females of the same species can mate successfully.

The next section, Eggs, describes with useful illustrations and photographs the various types of eggs and shapes of the egg-laying organ or ovipositor. Many female katydids use a long, sharply pointed ovipositor to lay their eggs in the ground. Other species are adapted to lay them in dead or living plant tissue, including grass stems and even plant galls. The shape of the ovipositor can be a useful indicator of the egg-laying habits of different species. David describes an intriguing outback katydid that oviposits on a twig, flies to the ground, gets a mouthful of moist soil, and returns to coat the egg with it, for camouflage!



The section on Growth and Development explains the basic development from egg to adult. Rather than having three distinct phases of growth as with, for instance, butterflies and bees, katydids grow gradually through a series of moults. The act of moulting usually takes place at night when humidity is highest and where in darkness a nymph, hanging soft and vulnerable from its support, is less likely to be attacked by a predator.

Within that basic framework of growth through moults, the appearance and habits of katydid nymphs are surprisingly varied. For protection from predators many species blend in colour with the leaves or flowers of their food plant and may even incorporate the pigments of the flowers into their own bodies. Some show bright colours that warn a predator of possible unpalatability or defensive attack, while harmless species may mimic insects more dangerous than themselves, such as ants or spiders – even assassin bugs.

The defence strategies of katydid nymphs can involve a marked difference in appearance from their parents, making it hard for us to complete specific life stories. David points out that for most species comparatively little work has been done to relate nymphs to their better known adults. So there is a wonderful opportunity for naturalists, young and old, to spend happy days (or more often nights) following the life histories of captive katydids and filling in the gaps.

The section on Food and Feeding discusses strategies for obtaining food, ranging from simple herbivory to predation or sometimes both. Most katydids are probably omnivorous though a number of predatory species occur in Australia. It is fascinating to read here that some species can actually lure their prey to them with special calls! Others stalk their victims like a praying mantis, or catch them in flight. David tells of a Mexican katydid that actually steals larvae from wasp nests at night! So they are not all like those the peaceful chompers on our garden plants.

It is sometimes possible to work out a katydid's feeding habit from the shape of the mandibles - though this may require dissection - and David describes the different types. Mandibles used as weapons by predatory katydids are long and hooked while those of seed-eaters are designed as powerful crushers. The 'standard' mandibles of most plant feeders are less specialized, but among the most strikingly unusual are the elongated mouthparts and prognathous head structures of the pollen feeders.

Being so abundant katydids provide a ready food source for many predators such as frogs, lizards, birds and bats. We often hear about the moths that confuse bats by imitating their echo-location calls, and we learn here that in some parts of the tropical world katydids, too, can use stridulation to confound bats! Camouflage and warning colours can deter sighted predators but invertebrate enemies such as wasps use other



senses to find their katydid prey while internal parasites include the amazing Gordian worms that can fill most of a katydid's abdomen.

The high-pitched songs of male katydids are a pleasant part of our summer nights. The chapter on Sound and Hearing tells us that these are made by rubbing together a file and scraper on the undersides of the left and right tegmen or 'wing cover'. A drawing clearly illustrates the mechanism and there are scanning electron microscope photographs of the various types of file. It has always intrigued me that most katydids wear their 'ears' on their 'knees' - or rather just below the tibia on the front legs. These auditory tympana together with another opening on the thorax convey vibratory sounds to the katydid.

Collecting and Studying Katydids is a useful chapter for those who wish to collect and dissect dead katydids. The chapter on Habitats covers many parts of Australia, with accompanying pictures. The chapter on Conservation is a salutary reminder that habitat destruction is not just putting the more cuddly animals at risk but also endangering the insects, which are the very basis of many ecosystems that we humans depend on.

The major part of the book, the Guide to Species, covers pages 42-190. The single family of Tettigoniidae includes 1000 or more species and David has sorted these out by subfamilies and tribes, starting with the most primitive groups. General features of the subfamilies, the tribes and the genera are covered and the species descriptions include not only diagnostic features and locations but also some interesting items about individual behaviour and life styles. The text throughout is clear and readable and as with the early parts of the book the descriptions are supported by a collection of excellent photographs.

Finally there is an illustrated key to the subfamilies of Australian katydids, a list of all our Australian species, a glossary and a list of references.

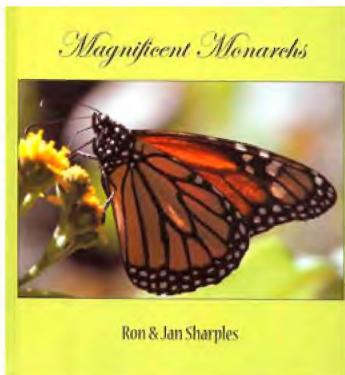
This is a truly comprehensive guide book. It will appeal to field naturalists of all ages who can use the photographs to check on their observations, and learn much from the text that will spur them on. Because of the book's scope as more than a simple field guide it will also be of great use to the more serious or scientifically minded katydid enthusiast. Our thanks to the author for sharing with us so ably his enormous knowledge. I thoroughly recommend his book.

As for me, I have now got out all my old katydid photographs and anticipate some pleasant hours re-checking identities and adding new data to the captions.



## Magnificent Monarchs by Ron & Jan Sharples –

Review by Skye Blackburn



Magnificent Monarchs by Ron & Jan Sharples is a book containing pictures of the couple's trip to the overwintering site for the Monarch butterfly in Mexico, as well as some basic information about the life cycle of the Monarch butterfly. Overall the book is quite interesting but is not suitable for people looking to gain any scientific knowledge about the butterflies.

I quite enjoyed looking at the pictures of the overwintering sites in Mexico, especially those with thousands of Monarch butterflies hanging from the trees.

The information provided with the pictures also gave an insight about the couple's trip, which I found entertaining. The basic information provided about the life cycle was short and to the point, which is good for people just learning about the life cycle of butterflies. I do have a couple of gripes though. The 2 pictures of the Monarch chrysalis that were shown in the book were both damaged. The first had been parasitised, and that is why there was "silk" going to the floor. The butterfly does not attach this (contrary to the information that was given in the book), but it is actually the exit point of the fly larvae that has infected the chrysalis when it has dropped to the floor. The second image is also of a Monarch butterfly chrysalis, but it actually shown upside down and the chrysalis itself is infected with *Ophryocystis elektroscirrha* which is a protozoan parasite of the Monarch butterfly. The colour of the chrysalis is explained in the book as being the colour change that occurs when the butterfly is about to emerge, but sadly the butterfly will probably never emerge from the infected chrysalis. The book ends with more pictures of the Monarch butterfly, and information about scientific research that has been conducted on their migration patterns from the USA to Mexico.

Overall I found the pictures and basic information in the book quite good (with a couple of notable exceptions). At the start of the book the authors explain that the book is not intended to be scientific, but to get people to find out more about the Monarch butterfly. Taking this in mind, I think this book has been a success.

Ed.: The book is available from Copy Right Publishing Co. Pty.Ltd. , GPO Box 2927 Brisbane, Qld. 4001 at a cost of \$27.50 including postage and handling.

<http://www.copyright.net.au>



## A first view of the Ruteline *Mesystoechus Ciliatus* Waterhouse (Scarabaeidae) - Murdoch De Baar

The day-flying Christmas beetle *Mesystoechus ciliatus* Waterhouse (Scarabaeidae: Rutelinae) is a rarely-seen rare species which was described by C.O. Waterhouse (1878), from specimens collected from "Moreton Bay" believed to have mainly come from Darra, Brisbane, based on some of the labels. Previously (before my observations) only 15 specimens were known (Peter G. Allsopp pers. comm.). It is a small species of about 9 to 11 mm. in length.

A living specimen of this beetle has never previously had a photograph published.

These beetles fly just above the ground and "from 1984 to 1990, all specimens flew from 1000 to 1400 hrs (EST) and between 26 October and 14 November" (De Baar, 1992). Since then some specimens have been taken a half hour or so on either side of these flight observations. In drought conditions, flights can be delayed till after storm rains and into early December. The males are very rapid fliers and can take off extremely quickly. It is difficult to photograph them unless a cloud passes by causing flying adults to rest awhile until the sun is exposed again.



An active diurnal Christmas beetle,  
*Mesystoechus ciliatus*, photographed  
7 November 2007 – Photo Murdoch De Baar

As no females have ever been taken, I assume (based on other beetle biologies) that females remain in soil and emit pheromones (males fly just above the ground, drop onto leaf litter, and dig down into the soil). They may be flightless and remain deep in the ground under scrubby environments (I have not been able to find any by digging 30 to 40 cm deep) and copulation may occur in the soil.

### References:

De Baar, M. 1992. Some observations on the ruteline beetle *Mesystoechus ciliatus* Waterhouse, 1878 (Scarabaeidae). News Bull. Ent. Soc. Qld. **20** (2): 20 – 21.

Waterhouse, C.O. 1878. On new Coleoptera from Australia and Tasmania. Transactions of the Entomological Society of London. pp 227-8.



## LETTER

School is going very well and the butterfly garden is rocking on. I don't know if you want to put this in the BOIC magazine but we saw an amazing thing last week. Around one of the Ganges Bluebell host plants I saw a different coloured Varied Eggfly looking to oviposit. It was lunch and the kids had just planted some Burny Vine, so I said "Let's watch it." As I got closer I couldn't believe my eyes when I

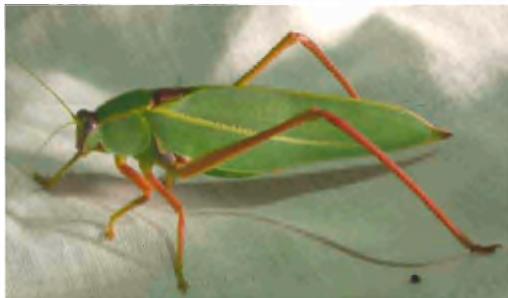
realised it was a Blue-banded Eggfly!!!! I had only ever seen two in my life in the Rocky area, and now because of the butterfly garden we had helped this rare butterfly. Unfortunately it didn't lay for us while we were watching - a bit much pressure from cheering kids!! But it did hang around for a day or two. If I'd had my net I would've caught it and got it to oviposit in my room!! Did get a photo though!



Letter and photo from Dave St Henry

## MYSTERY INSECTS

### What Katydid Is This? – Ross Kendall



The Katydid illustrated was attracted to light when we were camping in open eucalypt country west of Warwick at Easter this year. On consulting David Rentz's "A Guide to the Katydids of Australia" I reached the conclusion that it probably belonged to genus *Torbia*. After seeing the image, David confirmed this but was unable to give a species name, writing, "There are several

names available and a number of undescribed species too".

Photo Ross Kendall



# Who Lives Here in south west WA?

Diameter of burrow 10 mm  
Photo Margaret Greenway



## BUTTERFLY PUPA PHOTO GALLERY



*Cressida cressida*



*Graphium euryplys*



*Graphium sarpedon*



*Ornithoptera euphorion*





*Papilio aegeus*



*Papilio anactus*

Photos – *Cressida cressida* Hongming Kan, other photos Ross Kendall

## BUTTERFLY AND OTHER INVERTEBRATES CLUB PROGRAMME

### Planning and Management Meeting

<b>What:</b>	Our planning meetings are informative and interesting. As well as planning our activities we share lots of information. All members are welcome as this activity is also a general meeting of members.
<b>When:</b>	<b>Saturday 13<sup>th</sup> August, 2011 from 1.30 pm</b>
<b>Where:</b>	Capalaba
<b>RSVP:</b>	John Moss on 3245 2997 for directions

### SGAP Spring Flower Show and Plant Sale

<b>What:</b>	We will be holding a display at this event. Members looking for butterfly/moth hostplants may find something interesting amongst the plants for sale.
<b>When:</b>	<b>17<sup>th</sup> and 18<sup>th</sup> September, 2011</b>
<b>Where:</b>	The Auditorium, Mt. Coot-tha Botanic Gardens

### Kumbartcho Festival

<b>What:</b>	We will be holding a display at this event. Kumartcho Festival is a FREE family fun day for everyone. Enjoy wildlife shows, face painting, rock climbing wall, jumping castle, craft and candle making, river walks, nest box building and Apex BBQ plus heaps more.
<b>When:</b>	28 <sup>th</sup> August 2011 from 11 am – 3.00 pm
<b>Where:</b>	Kumbartcho Sanctuary, 15 Bunya Pine Court, Eatons Hill Park on Drapers Rd and catch the FREE mini shuttle bus .



## DISCLAIMER

The magazine seeks to be as scientifically accurate as possible but the views, opinions and observations expressed are those of the authors. The magazine is a platform for people, both amateur and professional, to express their views and observations about invertebrates. These are not necessarily those of the BOIC. The manuscripts are submitted for comment to entomologists or people working in the area of the topic being discussed. If inaccuracies have inadvertently occurred and are brought to our attention we will seek to correct them in future editions. The Editor reserves the right to refuse to print any matter which is unsuitable, inappropriate or objectionable and to make nomenclature changes as appropriate.

## ACKNOWLEDGMENTS

Producing this magazine is done with the efforts of:

- Those members who have sent in letters and articles
- Lois Hughes who provided the cover painting
- Daphne Bowden who works on layout, production and distribution
- John Moss and Michael Rix for scientific referencing and proof reading of various articles in this issue of the magazine
- Printing of this publication is proudly supported by Brisbane City Council

We would like to thank all these people for their contribution.



*Dedicated to a better Brisbane*

## ARE YOU A MEMBER

Please check your mailing label for the date your membership is due for renewal. If your membership is due, please renew as soon as possible. **Membership fees are \$25.00 for individuals, schools and organizations.** If you wish to pay electronically, the following information will assist you: BSB: **484-799**, Account No: **001227191**, Account name: **BOIC**, Bank: **Suncorp**, Reference: your membership number and surname e.g. **234 Roberts**.

Butterfly and Other Invertebrates Club Inc.

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RUNCORN Q. 4113

**Next event** – Planning and Management Meeting – Saturday 13<sup>th</sup> August, 2011



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